# Interim Low Bit Rate Algorithm

- **Purpose**
- **General Approach**
- **Issues**
- **Candidate Solution**

# Purpose & Approach

- **Purpose**
  - **To provide an effective low bit rate algorithm that can be used prior to the adoption of any "next generation" algorithm(s)**

- **Approach**
  - **Use a pair of matched resampling functions**
    - » **scale image (downsample) prior to compression**
    - » **scale image (upsample) post compression**

# Issues

- **Backwards compatibility**
  - **Want older decoders to decode image?**
  - **Overlay issues**
- **For blocked imagery:**
  - **block first or downsample first?**
- **Which image sizes should be stored in:**
  - **the image subheader?**
  - **the JPEG SOF marker segment?**
- **After downsampling 8-bit mono image (M8):**
  - **process image as M8 or M12?**

# More Issues

- **JPEG Tables:**
  - **Which Quantization Matrices (QMs) should be used?**
  - **Which Huffman Tables should be used?**
- **How should we vary rate?**
  - **downsampling ratio or QMs**
  - **both**
- **Parameters:**
  - **How should we signal that the image is downsampled?**
  - **What other parameters need to be signaled?**
  - **Can we fix the filter?**

# Candidate Solution

- **Indication of Interim Algorithm in NITFS file**
  - **Use IC field in NITFS image subheader. Use an S# value**
    - **» How can we combine with masked images M#?**
    - **» What will other decoders do?**
  - **Use JPEG Process field in APP6 marker segment**
    - **» Can still use C# & M# in IC field, say interim file is JPEG**
    - **» For each JPEG process using interim alg. need number**
    - **» Decoder will not know until APP6 is read**
    - **» What will other decoders do?**
  - **Use only new APP marker, its presence will indicate interim algorithm**
    - **» No change in IC field**
    - **» No change in JPEG process field**

# Candidate Solution

- **Image Sizes:**
  - **NITFS image subheader indicates original image size**
    - **» Want true data size in NITFS data area**
  - **JPEG SOF marker segment indicates the downsampled image size**
    - **» Necessary to be JPEG compliant**
    - **» Image subheader and SOF marker sizes are different**
    - **» What will other decoders do?**
- **Block the image prior to downsampling**
  - **just as you would prior to any compression**
- **After downsampling M12 processing preferred, but can use M8**

# Candidate Solution

- **Rate/Quality Control & JPEG Tables**
  - **New Q and Huffman tables**
  - **JPEG encoding at 0.65 bpp on downsampled image**
  - **Downsampling ratio to be varied to accommodate rate control**
  - **Tables will be placed in the stream, no defaults**

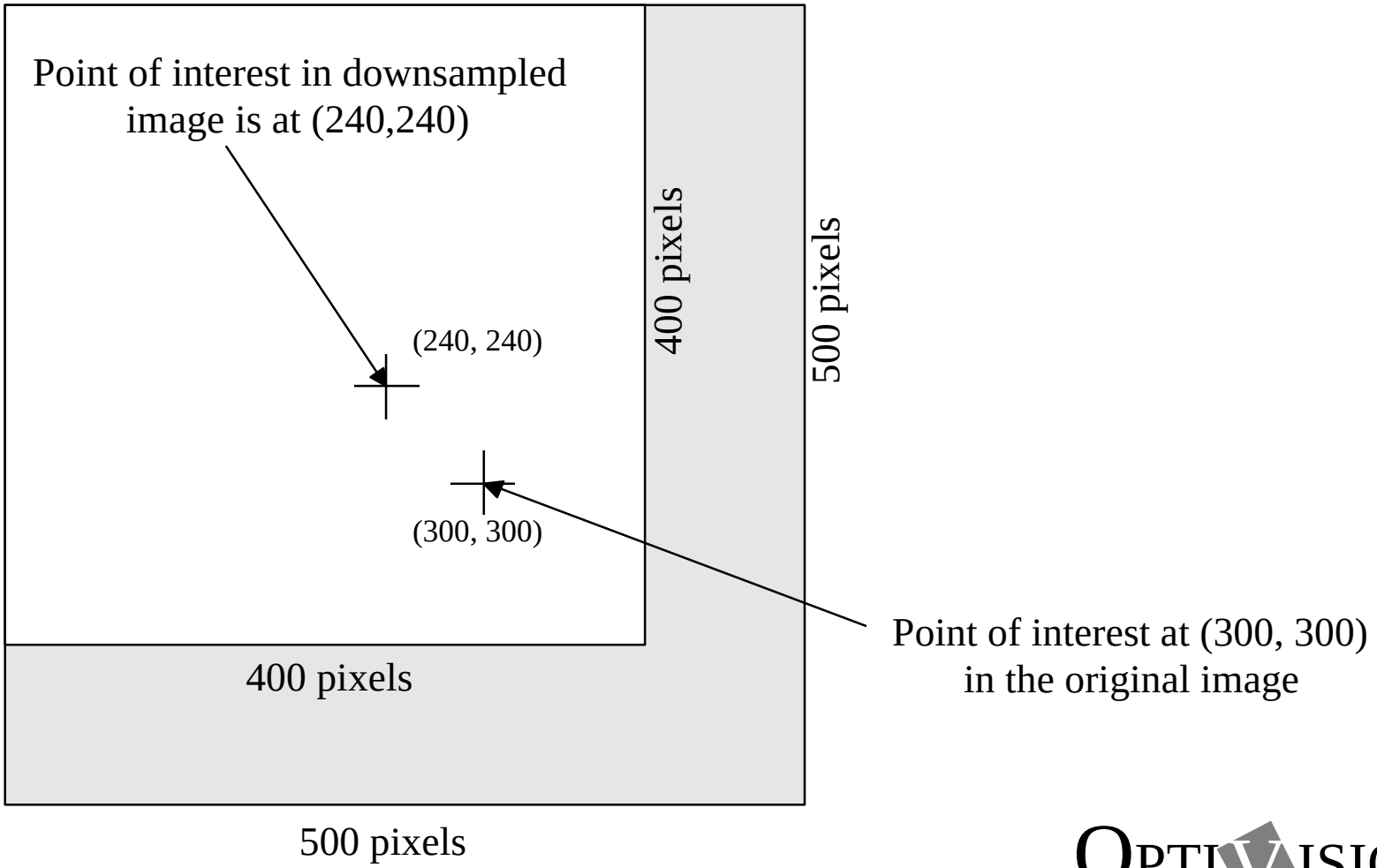
- **Need new APPn marker in JPEG stream**
  - **Indicates original image size**
    - **» Want stream to stand on its own**
    - **» Will indicate use of interim algorithm**
    - **» Place after initial APP6 marker segment**
  - **Image subheader IMAG field for informative purposes only. Insufficient accuracy to properly convey subsampling ratio**

# Candidate Solution

- **Filter size**
  - **Filter size is “fixed”**
  - **No parameters to convey to decoder other than original size**

# Overlay Issue

- **If non-iterim system decodes interim file, it will create a smaller version of original image. Overlays can be in error.**



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